

[0013] FIG. 5, a longitudinal vertical section of a two ended coupling of FIG. 1 taken on the line 1-1 of FIG. 1 showing two triangular type seals; and

[0014] FIG. 6, a longitudinal vertical section of a two ended coupling with inverted deformed "U" type seal, mounted on two rings with slanted faces where the rings are welded to pipe end portions;

[0019] First, the coupling for grooved end pipe, FIGS. 1 to 6, will be explained simultaneously. FIGS. 1 and 2 are the same, except that FIG. 2 shows a reverse view, and it shows relative position of weight and power arms with respect to each other. As shown in FIG. 1, the coupling has body C with outer diameter C1 and inner diameter C2. The depth of the inner groove G1, which is used to accommodate lever jaws J, is depicted by the height between inner diameters C2 of the coupling body and groove diameter 31. The coupling C is shown to engage pipe 14 with inner and outer diameters 20 and 21 respectively. The two ends of lever J are shown by J1 and J2. Concentric with the coupling, an arcuate portion J4, of lever jaw J, is delineated by J2, J6 and J7. J4 is concentric with the coupling body, with the pipe, with the inner groove in the body of the coupling, and with the groove in the outer surface of the pipe. The section between J7 and J9 diverges from said arcuate section J4, by making an interior angle at J7 with J4, outward and away from the center of the coupling to the fulcrum ~~an~~ and integral axle J3 of the lever jaw. The power arm J8 shown in FIGS. 2, 3, 5 and 6 between J3 and J12, exits out of the coupling by making an offset interior angle with the weight arm at J9. The weight arm J5 and the power arm J8 are kept apart by means of circular stem J15 shown in FIG. 3. The power arm J5 preferably is a replica of the weight arm J8. The section ~~between~~ of the power arm between J11 and J18 (shown in FIG. 3) diverges from the arcuate section J8 by making an interior angle at J11 with J8. Lever jaw J is held in position to coupling body C by means of a fulcrum integral axle J3, located in a cut delineated by 32, 33, and ~~33~~ 34, where groove G1 is also interrupted. The power arm J8, between

J3 and J12, rotates the weight arm from J3 to J2, about the fulcrum J3. The portion of lever jaw J4, between J2 and J6, is designed to engage the groove of the pipe. The groove on the end portion of the pipe is indicated by 22.

[0024] Fig. 4 employs a diaphragm type of gasket seal, which will also be explained under FIGS. 7 and 8. Diaphragm seal 1 in FIG. 4 is a miniature seal of the same design as in FIGS. 7 and 8. Seal 1 is provided with openings 12 and 12A to pressurize the seal with fluid in the pipe line. The outer surface 21 of pipe 14 provides a seat for gasket 1. Through cavity 19 and openings 12 and 12A, fluid reaches internal cavities 13 and 13A, and pressurizes diaphragm seal 1, thus blocking the exit of fluid between 14 and 11. The lever jaws with their wight and power arms are not shown in FIG. 4. The FIG. 3 4 shows clearly groove G1 for the lever Jaw weight arm, and the groove 22 constructed in the ring welded to the pipe or around the pipe.